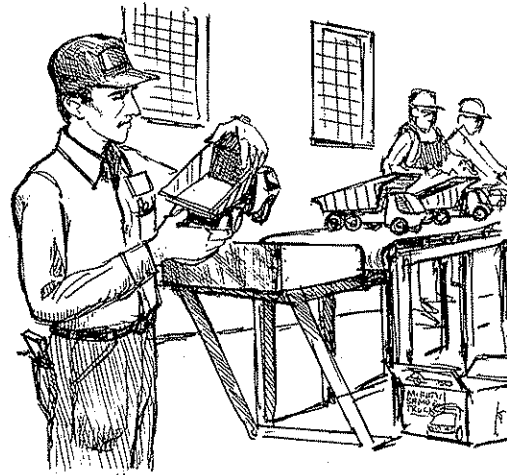


The place of inspection varies. It can be done at every work station or at certain locations to which the products are transported. (It may be simply at the end of the production line.) At these inspection points, personnel are more or less specialized and removed from contact with the workers who make the products.

A wide variety of devices are used for inspection. Gauges (often used by the workers themselves in checking their own work), X-ray equipment (used to detect flaws in castings and other materials where "naked eye" inspection is inadequate), electrical apparatus, chemical processes, and other means are used. The purpose of inspection is to spot items not up to standards allowed, to expose weak points in the production process, and, ultimately, to help build good will by preventing the shipment of less-than-standard products. This procedure is another step in the manufacturing process designed to bring the consumer products at predetermined quality standards.



➤ On the blank, write the correct answer:

- (1) The establishment of reliability standards and inspection of products by those standards are _____.
- (2) Every item produced is inspected for quality and reliability. (True or false?)

- (3) The following item was *not* mentioned in this PACE as an inspection device:

a. gauge b. X-ray c. microfilm d. chemical process

Answer these questions to test your understanding of this section. If you score below 90%, restudy the section. If you score above 90%, you should restudy any areas you did not understand.

CHECKUP
(each answer, 5 points)

➤ On the blank, write the correct answer:

- (1) Manufacturing is the process of transforming raw materials into _____.
- (2) Employment for approximately 30% of the American work force is provided by _____ industries.
- (3) From England, America learned _____ methods.

(4) Immediately following the Civil War, America began the change into an _____ society.

(5) Since World War II, all sections of the United States have become _____.

➤ Answer true or false:

- (6) _____ The American business system was a struggling production economy until the middle 1900's.
- (7) _____ A method that helped move America forward to leadership in manufacturing was "scientific management."
- (8) _____ In early America, manufacturing was concentrated largely in the New England and Mid-Atlantic states.
- (9) _____ Petroleum refining in Oklahoma is an example of quality control.
- (10) _____ A benefit of large-scale operations is more economical per-unit production.

➤ On the blank, write the correct answer:

- (11) Large-scale volume production of goods by using standardized parts that are interchangeable is _____.
a. mechanization b. mass production c. large-scale operations
- (12) The use of machines and machine power in the production of goods is _____.
a. mechanization b. mass production c. automation
- (13) Expansion of production facilities by manufacturers for more economical per-unit production is referred to as _____.
a. automation b. standardization c. large-scale operations
- (14) Setting up methods, equipment, machine parts, procedures, and processes to conform to uniform patterns is _____.
a. automation b. standardization c. mechanization
- (15) The complete performance of a complex mechanical process without human intervention is _____.
a. automation b. mechanization c. mass production

► Match these items: (not all answers will be used)

- | | |
|------------------------------|-----------------------------|
| (16) _____ mass production | a. standards and inspection |
| (17) _____ robot | b. electronics |
| (18) _____ quality control | c. coded tapes |
| (19) _____ miniaturization | d. problems of reliability |
| (20) _____ numerical control | e. interchangeable parts |
| | f. specialization |
| | g. gauges |

Score = 100
My Score = _____

"Every man's work shall be made manifest: for the day shall declare it, because it shall be revealed by fire; and the fire shall try every man's work of what sort it is. If any man's work abide which he hath built thereupon, he shall receive a reward."
1 Corinthians 3:13-14

II. GETTING THE PRODUCT TO THE CONSUMER

In PACE 98, a great deal of emphasis was placed on the market orientation of business in the United States. Marketing is customer oriented. The goods and services produced in this country come into being because the producers believe these products are wanted and can be sold profitably.

Part of the marketing process is discovering what goods and services consumers need and want. That task is assigned to marketing research. A second part of the marketing process is distribution: methods used to provide the products for consumers in the places where they are, at the times they want them, and at prices they are able and willing to pay. This distribution aspect of marketing will be studied in this section.

Production is of little value unless some arrangement is made for moving what is produced from where it is made to where it is to be sold or used. Therefore, transportation (or physical distribution) of goods from one place to another merits an important place in business activity.

Physical distribution can involve the movement of materials *into* a plant, the movement of materials *within* the plant, and the movement of finished goods *out* of the plant. This discussion will focus on the movement out of the plant to where the consumer can buy or use the product.

Transportation Costs

Moving materials costs money. Transportation expenses, therefore, add to the selling price of consumer goods. Merchants who want to keep the price of their products as reasonably low as possible strive to minimize transportation costs; they look for the most inexpensive method that will meet their objective—getting goods from the factories where they are made to a location convenient to the consumer (or user). The costs are frequently underestimated; often the costs to move goods from

producer to the customer are greater than the costs to produce them. Costs of shipping an automatic washer from the manufacturer to the retail outlet where it is sold are relatively easy to compute; but to get the true "distribution" costs of this washer, other costs should be included. These costs include transporting raw materials from their origination points to the factory that assembles the washer; storing, handling, and even packing costs. Producers and merchants who sell the merchandise all look for ways to economize on these costs to keep the price to the consumer as low as practical.

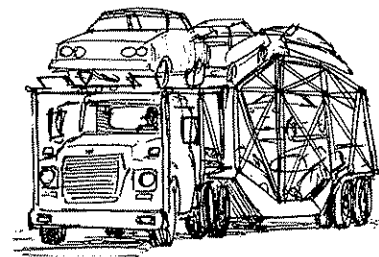
► On the blank, write the correct answer:

- (1) Transportation costs add to the selling price of consumer _____.
- (2) Often the costs to move goods from producer to customer are greater than the costs to _____ them.

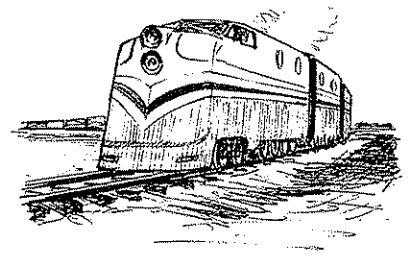
Legal Classifications

Companies who engage in the transportation business are called *carriers*. These firms are legally classified as (a) common carriers, (b) contract carriers, and (c) private carriers.

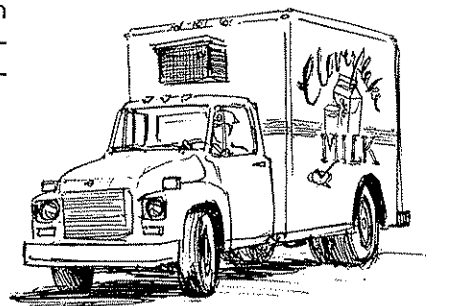
Common carriers. Common carriers offer services to the general public to transport goods for a stated rate under standard rules. They are expected to give the same service and charge the same rate to all shippers. Some examples are railroads, bus lines, commercial airlines, and trucking companies.



Contract carriers. Contract carriers sell transportation services on the basis of individual agreements or contracts. Some may specialize, carrying only specific types of goods. Some examples of contract carriers are chartered buses, trains, and automobile trucking companies.



Private carriers. Private carriers transport their own goods. They are usually small companies operating in small geographical areas and are subject primarily to local and state regulations.



► On the blank, write the correct answer:

- (1) Transportation companies are called _____.
- (2) Transportation companies are classified legally as
 - (a) _____ carriers,
 - (b) _____ carriers, and
 - (c) _____ carriers.

- (3) Railroads, bus lines, and commercial airlines are examples of _____ carriers.
- (4) Chartered buses, trains, and planes are examples of _____ carriers.
- (5) Companies that transport their own goods and are subject primarily to local and state regulations are _____ carriers.

Three main kinds of transportation are ① land, ② water, and ③ air.

Land Transportation

Commercial means of land transportation include railroads, motor trucks, "piggyback" service, and pipelines.

Railroads. These carriers contributed a great deal to America's industrial progress westward. However, in recent years, railroads have encountered some severe financial problems; many have gone bankrupt. Railroads had such difficulty in operating profitably that the federal government attempted to come to their rescue in 1973 with an antibankruptcy solution called the *Regional Rail Reorganization Act*. Some \$2 billion has been spent since 1973 to assist the ailing railroads. Another proposed solution is called Conrail, a quasi-private firm to move freight for Penn Central and six other Northeast rail lines, which haul more than half of the nation's industrial cargo.

The chief *advantage* of railroads is that they can haul bulky goods over long distances at low cost in a relatively short time. Other advantages are regular, reliable schedules (bad weather has little effect on their activities); an impressive safety record (shippers can expect to have their goods arrive at their destination in good condition); and the variety of services offered.

The chief *disadvantage* of railroads is that they do not always meet the needs of the small shipper. Other disadvantages include lack of flexibility ("breaking up the train" or dropping off cars is expensive and time-consuming); slow speed on short distances; and lack of accessibility (freight terminals are usually located in congested areas; thousands of small communities are not served by any railroad at all).

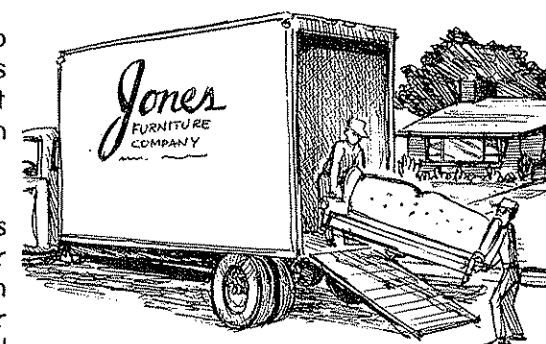
Motor trucks. One method of land transportation, trucking, reaches communities that are inaccessible to railroads and other carriers. Commercial trucking developed rapidly in the United States after the *Federal-Aid Road Act* of 1916 placed emphasis on well-constructed hard-surfaced pavements and intercity highways. With the coming of good highways, several manufacturing firms designed and built various types of motor trucks to specifically meet the needs of businesses who wanted to transport goods by highway.

As late as 1940, motor vehicles transported only 10% of all intercity freight, but the advantages of shipping by truck appealed to shippers. In the mid 1960's, approximately three out of every four tons of commercial goods transported in the United States were transported at least *part* of the way by trucks. (Some goods are shipped by more than one method of transportation to reach their destination.) High quality gasoline and rubber tires, products that you may take for granted, also helped the trucking industry develop rapidly.

Among methods of land transportation, trucking is the most adaptable and flexible method of transportation for commercial goods. One of the greatest *advantages* of truck transportation is the quick and convenient delivery service it makes possible. Door-to-door deliveries provided by trucks eliminate the expensive handling of merchandise between terminal points and points of consumption (where the buyer selects the goods for purchase).

As the trucking industry developed, it aided the development of the warehousing industry. Trucking enabled retailers to buy in smaller quantities, to maintain a smaller inventory, and to invest less of their cash in merchandise. Local warehouses can keep stock available for them. Goods are available, almost on call, by trucks from the wholesaler's warehouse.

The consumer himself profits from truck deliveries. To stimulate buying, many retailers rely heavily on free deliveries of their products to a consumer's home. They have found that the added expense for deliveries is returned generously through increased sales.



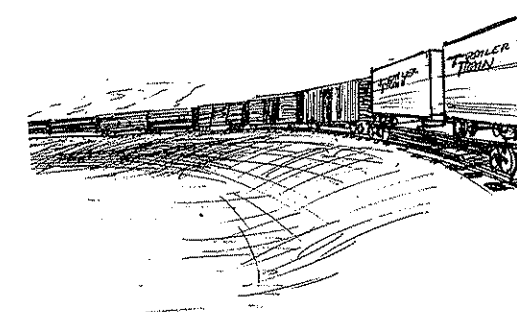
One important advantage of trucks mentioned earlier is that they can reach communities that are inaccessible to other means of transportation. Even with advance technology in America, thousands of towns are without rail, air, or water transportation facilities. Without trucks, these towns would practically be cut off from the commercial world of consumer-goods delivery.

On short hauls, truck transportation is generally less expensive than other means of transportation. Owning or leasing trucking vehicles themselves is within a price range that most businesses can afford. More than 90% of all United States business firms use the services of trucking companies that operate as public carriers: the remaining 10% operate their own trucks.

Truck shipping also has *disadvantages*. Long-distance transportation by truck tends to be more expensive than rail transportation. Also, even very large trucks can transport only a fraction as much freight as a railroad car.

Transportation costs charged by trucking firms are not left completely to the judgment of the firm's management. The *Motor Carrier Act* requires motor carriers (such as truck firms) to publish their rate tariffs (prices charged for their services) and to file them with the Interstate Commerce Commission. Even motor contract carriers (see page 11) must file their rates but need not publish them. These kinds of requirements exist when an industry is *regulated* by a governmental agency. Railroads are also regulated. You will read more about regulation later in this PACE.

"Piggyback" service. Although motor carriers and rail carriers compete for transportation business, they have a combined service that promises to overcome the major shortcomings of both systems. This development is called "piggyback" service. Through the use of new mechanical devices, loaded truck trailers are placed on railroad flatcars. Truckers at both ends of the journey take care of pickup and delivery. This service takes advantage of the truck's flexibility at pickup and delivery points and the railroad's lower long distance costs.



Pipeline. One means of transportation often forgotten by those not familiar with its operation is the pipeline system in our nation. We hear less about pipelines because they are such a specialized system. For most of the life of this transportation system, it has been devoted exclusively to the movement of petroleum products, including natural and artificial gas. More recently, limited quantities of powdered coal and wood pulp have been transported by pipeline. In 1961, furnaces were developed that can burn coal slurry with 30% water content, so pipeline-pumped coal has become almost as easy to handle as fuel oil.